# METHOD AND SYSTEM FOR SCREENING ELECTRONIC MESSAGES

## BACKGROUND OF THE INVENTION

### 1. Technical Field:

5   The present invention is related generally to electronic messages transmitted

from and to users of a data processing system, and more particularly, to screening of

such messages.

### 2. Description of Related Art:

The proliferation of e-mail has had many beneficial effects, but has

10   unfortunately had at least one negative side effect. That is, there has also been a

proliferation in junk e-mail, also known as "spam," the receipt of which is often

unwanted by a computer user. Not only is unwanted junk e-mail a nuisance to the

recipient, but data processing resources which could be put to better use are devoted

to processing the unwanted e-mail.

15   Furthermore, other types of electronic messages are also popular, such as

"instant messaging" which is communicated in a somewhat different way than e-mail.

Instant messaging has certain privacy features which tend to make this

communication medium less subject to unwanted messages. For example, in some

instant messaging systems a user limits whose instant messages the user will receive

20   by specific enumeration of authorized senders. It is nevertheless anticipated that

unwanted electronic messages may rise to a burdensome level, even in

communication media other than just e-mail. Therefore a need exists to reduce the

burden on users who are targets of unwanted electronic messages, including e-mail,

and to discourage the sending of spam.

## SUMMARY OF THE INVENTION

The present invention addresses these needs by way of a method, system, apparatus and computer program product for screening electronic messages, wherein

5    a sentry (a.k.a. "screening agent," a.k.a. "screening tool") determines whether electronic messages to a receiver include respective passes from the receiver. Responsive to such a message having a pass, the receiver is notified about the message. Responsive to the message not having a pass, a notice for the sender is generated about a pass for the message. Ultimately the pass is generated and sent, on

10    behalf of the designated receiver of the message, to the sender. Unless the sender of the electronic message receives the pass which was returned to the sender by a screening agent for the designated receiver, and the sender returns the pass to the receiver, then the screening agent discards the message and the receiver will not ever be burdened with the message. Thus, if the sender's message has an invalid

15    electronic message reply address, as is frequently the case for mass marketing senders, the sender will never receive the pass, and the receiver's screening agent will discard the message. Both the pass generation and sender notification may be without regard for the identity of the sender. That is, responsive to every message for which the screening agent has not already generated a pass, the recipient's screening agent

20    automatically generates a pass and sender notification. Therefore, no significant burden is placed on the designated recipient even to merely set up rules for screening messages.

It is an advantage of the invention that unless the sender of a first electronic

message obtains a pass and returns it to the designated receiver, then the screening

agent for the receiver may discard the first message and the designated receiver will

not ever be burdened with the message. In addition, it is an advantage that the

invention will discourage the use of invalid reply addresses, such as is widely done by

5    mass marketing agents. This will tend to improve the ability of a recipient of

unwanted e-mail to determine who is the sender of the e-mail, thereby providing the

recipient more avenues for counteraction, which will tend to reduce unwanted

messages.

In a feature of the above described embodiment, the designated recipient's

10    screening agent automatically generates a notification for the sender, which may

include automatically generating a pass and automatically sending the pass to the

sender. It is an advantage of these features that for the designated recipient of an

electronic message, the message screening is transparent, placing no significant

burden on the designated recipient to screen messages one-by-one, i.e., on a case by

15    case basis.

These and other advantages of the invention will be further apparent from the

following drawings and detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the

20    appended claims. The invention itself, however, as well as a preferred mode of use,

further objectives and advantages thereof, will best be understood by reference to the

following detailed description of an illustrative embodiment when read in conjunction

with the accompanying drawings, wherein:

Figure 1 illustrates sequences of three messages, according to an embodiment.

Figure 2 illustrates an embodiment of the sentry, including a pass detection agent, a notification agent, and a forwarding agent.

Figure 3 illustrates details of the pass detection agent.

5 Figure 4 illustrates details of the notification agent.

Figure 5 illustrates, in block diagram form, a data processing system for implementing the disclosed embodiment.

Figure 6 shows an alternative aspect of how the body of a message is handled.

Figure 7 shows details for notifying a sender about a pass.

10 Figure 8 shows details for pass detection.

Figure 9 illustrates details of forwarding to a receiver a message having a pass.

Figure 10 illustrates an alternative for notifying a sender about a pass.

Figure 11 illustrates another alternative for notifying a sender about a pass.


15 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to Figure 1, a plurality of sequences of messages are illustrated, according to an embodiment of the invention. The plurality of first messages, 130.1 through 130.N, are from a corresponding plurality of senders 110.1 through 110.N, and are all addressed to a single designated receiver 120. For each of the first

20 messages, 130.1 through 130.N, the receiver's screening agent 160 generates corresponding second messages, that is, reply messages, 140.1 through 140.N. For each of the second messages, 140.1 through 140.N, the sender's, 110.1 through 110.N, may generate corresponding third messages, 150.1 through 150.N, back to the designated receiver 120. Although N third messages, 150.1 through 150.N, are shown

25 in Figure 1, it should be understood there will only be N third messages generated and

returned to the designated receiver 120, if all N senders, 110.1 through 110.N, used a valid reply address in corresponding first messages, 130.1 through 130.N, and then responded to the second messages, 140.1 through 140.N, as will be further appreciated from the following, more detailed description of one of the sequences of

5    first, second and third messages.

The first sequence of first, second, and third messages, 130.1, 140.1 and 150.1 respectively, is now described. Since this description of the sequence of three messages could equally apply to any of the sequences 1 through N, and for convenience, this description will omit reference to the sequence number "1" and

10    simply refer to "first message 130," "second message 140," "third message 150," and "sender 110" although it should be understood that the description is literally of first message 130.1, second message 140.1, third message 150.1 and sender 110.1.

The first message, message 130, is from a sender 110. The sender has a reply address "a@ xyz.com." The designated receiver 120 has a reply address

15    "b@uvw.com." Thus, the first message has a send address of "b @ uvw.com," and a reply address of "a@xyz.com."

Responsive to the first message, the designated receiver's screening agent 160 parses the send address, that is, "b@uvw.com," and responsive to determining that the send address does not include a valid pass , generates a second message, message

20    140. Since the second message is from the receiver's screening agent for the designated receiver of the first message, to the sender of the first message, the second message has a send address of "a @ xyz.com. " However, the reply address, instead of saying "b@uvw.com," has a "." added after the "b" and a string of alphanumeric

characters, represented in Figure 1 as "<pass>," inserted between the "." and the "@."

The "." serves as a delimiter, and is merely to simplify parsing of the reply address,

which will be later described. It should be understood that another symbol could be

substituted for the ". " or the "." could be omitted. For example, the pass may be a

5    predetermined number of characters, so that it may parsed as that predetermined

number of characters in the address which are immediately to the left of the "@."

Included in the message 140 is an indication to sender 110 that the sender

should generate another message, that is, the third message 150, which uses the reply

address from the second message 140 as the send address for the third message . This

10    reply address from the second message 140 is the reply address, previously described,

having the pass embedded therein.

When the receiver's screening agent 160 receives the third message 150, the

screening agent parses the send address to extract the pass, and further processing is

done to determine whether the message 150 is forwarded to the designated receiver

15    120, as will be further described in the following.

Referring now to Figure 2, an algorithm is shown, in flow chart format , which

illustrates an embodiment for sentry 160. The algorithm begins at block 210. Next, a

message is intercepted by the designated receiver's intercepting agent 220 . Next, a

pass detection agent 230 gets the message from agent 220 and determines whether the

20    incoming message has a valid pass for the designated receiver. If the message has a

valid pass, then agent 230 gives the message to forwarding agent 240, which forwards

the message to the designated receiver, or at least notifies the receiver of the message.

If the message does not have a valid pass, then agent 230 gives the message to a

notification agent 250, which generates a pass and a notice about the pass to the sender . Notifying the sender, in the illustration of Figure 1, includes automatically sending the second message to the sender, with the pass embedded in the reply address of the second message, and indicating to the sender that the sender should

5    re-send to the altered reply address.

It should be understood in connection with the above, that in the embodiment, the receiver's screening agent 160 is not selective in responding to messages which it receives. That is, the receiver's screening agent automatically examines every message which it receives for a valid pass, and, if the message does not have a valid

10   pass - that is, a pass which the screening agent itself generated earlier - the screening agent automatically generates the pass every time, and notifies the sender of the pass.

Referring now to Figure 4, details are shown of Figure 2, notification agent 250, which concerns generating a pass and notice to the sender, for example, the sender of a first message, i.e. "msg. 1." For example, the first message may be

15   message 130.1 of Figure 1, which is shown in more detail in Figure 7.

In step 410 of Figure 4, the reply address of the incoming message is determined. In the example of Figure 7, the reply address 705 is "a@xyz.com."

Next, in step 420 of Figure 4, a pass is generated. As shown in Figure 7, the pass 725 indicates the reply address 705 as the address for an authorized sender, and

20   indicates an expiration time 720 after which the pass will no longer be valid. Thus, before it is encrypted, the pass character string would look like this for example, "a@xyz.com,2000-08-31,11:00AM."

Next, in step 430, the pass is encrypted. That is, in Figure 7 for example, the

un-encrypted character string 725, " a@xyz.com,2000-08-31,11:00AM," is

transformed using some well-known encryption technique into an unintelligible string

730.

Next, in step 440 of Figure 4, the encrypted pass is embedded in the reply

5    address for the message. Thus, for the example in Figure 7, the send address 710 in

message 130.1 is combined with the pass 730 to provide the reply address 745 for

message 140.1

Referring now to Figure 3, details are shown of Figure 2, pass detection agent

230. For an incoming message a send address is first parsed, as shown in step 310.

10    For example, see Figure 8, which shows message 150.1 from Figure 1 in more detail.

The send address 808 from the message 150.1 is parsed by the sentry 160. Characters

between the first ". " and the " @" are extracted by the parsing. These characters

represent, in encrypted form, a possible valid pass 730.

Next, in Figure 3, at step 315 a determination is made whether any characters

15    were found by the parsing which might qualify as a valid pass. If no possibly

qualifying characters are found, then the agent 230 branches to 370, and an indication

is returned that the incoming message does not have a valid pass. For example, if the

incoming message is message 130.1 of Figure 1, this "no valid pass" indication

would apply, since the message does not even have a delimiter "." to the left of the

20    "@" character, and therefore also has no other characters (represented herein

generically by "<pass>") between a "." delimiter and the "@" character.

Next, at step 320 of Figure 3, if characters possibly qualifying as a pass are

found, they are decrypted. For example, for message 150.1 in Figure 8 the pass

detection agent 230 converts encrypted pass 730 to decrypted pass 815.

Then, at step 330 of Figure 3, the decrypted characters are analyzed and further parsed, to determine an indicated sender and time limit. For the example of message 150.1 in Figure 8, decrypted pass 815 is parsed into an indicated sender 820

5    and indicated time 825.

Next, at step 340 of Figure 3, the reply address of the message is compared to the sender and time limit indications from the decrypted characters. In the example of Figure 8, the reply address 805 of message 150.1, i.e., "a@xyz.com," is compared to the indicated sender 820, also "a@xyz.com." If the sender indicated does not

10    match the reply address, then, the pass detection agent 230 in Figure 3, at 370, passes an indication to notification agent 250 that the incoming message does not have a valid pass. If the sender indicated by the pass does match the reply address, as it does in the example of Figure 8, then, at block 350 in Figure 3, the time indicated by the pass is compared to the current time, as shown in Figure 8, wherein indicated time

15    825 is compared to current time 830.

If the time limit has been exceeded, then, at block 370, the pass detection agent 230 passes the indication that there is no valid pass to notification agent 250. If the time limit indicated by the pass has not been exceeded, then, in Figure 3 at block 360, the agent 230 passes an indication to forwarding agent that the incoming

20    message has a valid pass.

For a message having a valid pass, such as third message 150.1 as shown in Figure 8, the message is forwarded to the designated receiver by forwarding agent 240 in Figure 2. Details of this are shown in Figure 9.

Since there is no user in the system which has an actual address like send

address 808 in Figure 8, to notify the user a mechanism is included to recognize the

send address of the message 150.1. That is, the sentry 160 interacts with conventional

features of an e-mail server to identify the recipient of the third message 150.

5    According to the embodiment shown in Figure 9, the forwarding agent 240 parses the

send address 808 of incoming message 150.1 to remove the pass 730 therefrom. The

resulting address 910 indicates an intended recipient. The agent 240 compares this

address 910 with the e-mail database of users. If there is a user 120 which matches

address 910, then, responsive to an indication, as described in connection with

10   Figures 3 and 8, that the pass for message 150.1 is valid, the agent 240 forwards the

message 150.1 to the user 120.

In an alternative embodiment, in connection with sending a message such as

message 140.1 in Figure 7, the agent 240 causes a user name corresponding to reply

address 745 in Figure 7 be added to a database of valid e-mail addresses, so that when

15   a message such as message 150.1 in Figure 8 is received, the send address 808

corresponds to the user name that was added when the notification agent 250 sent

message 140.1, and the user name is recognized.

Referring now to Figure 6, an alternative aspect of the embodiment is

illustrated. In the alternative, the original message from the sender 610, includes body

20   610, but the second message 640 does not include the body 610. The notification

agent 250 of the sentry 160 inserts a notice 615 in the second message 640, and strips

out the body 610 of the first message 630, and saves it for possible later use for the

forwarding agent 240. Then, if the sentry 160 receives third message 650

corresponding to second message 640, the forwarding agent 240 of the sentry 160 combines body 610 with message 650 before forwarding the combined message 651 to the designated recipient 120, if the third message 650 has a valid pass.

Referring now to Figure 10, an alternative embodiment is shown, in contrast

5      to Figure 7, wherein the e-mail message 140.1, which notifies of the pass 730, points to an attachment 1010 which contains the pass 730, instead of embedding the pass 730 in a reply address 745 of an e-mail message as was shown in Figure 7.

Referring now to Figure 11, an alternative embodiment is shown, also in contrast to Figure 7, wherein the e-mail message 140.1, which notifies of the pass

10     730, points to a web site 1110 which contains the pass 730.

With reference now to Figure 5, a block diagram of a data processing system in which the present invention may be implemented is illustrated. Data processing system 500 employs a peripheral component interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus architectures, such as

15     Micro Channel and ISA, may be used. Processor 502 and main memory 504 are connected to PCI local bus 506 through PCI bridge 508. PCI bridge 508 may also include an integrated memory controller and cache memory for processor 502. Additional connections to PCI local bus 506 may be made through direct component interconnection or through add-in boards. In the depicted example, local area

20     network (LAN) adapter 510, SCSI host bus adapter 512, and expansion bus interface 514 are connected to PCI local bus 506 by direct component connection. In contrast, audio adapter 516, graphics adapter 518, and audio/video adapter (A/V) 519 are connected to PCI local bus 506 by add-in boards inserted into expansion slots.

Expansion bus interface 514 provides a connection for a keyboard and mouse adapter

520, modem 522, and additional memory 524. In the depicted example, SCSI host

bus adapter 512 provides a connection for hard disk drive 526, tape drive 528,

CD-ROM drive 530, and digital video disc read only memory drive (DVD-ROM)

5   532. Typical PCI local bus implementations will support three or four PCI expansion

slots or add-in connectors.

An operating system runs on processor 502 and is used to coordinate and

provide control of various components within data processing system 500 in Figure 5.

The operating system may be a commercially available operating system, such as

10   OS/2, which is available from International Business Machines Corporation. "OS/2"

is a trademark of International Business Machines Corporation. An object oriented

programming system, such as Java, may run in conjunction with the operating system,

providing calls to the operating system from Java programs or applications executing

on data processing system 500. Instructions for the operating system, the

15   object-oriented operating system, and applications or programs are located on a

storage device, such as hard disk drive 526, and may be loaded into main memory 504

for execution by processor 502.

Those of ordinary skill in the art will appreciate that the hardware in Figure 5

may vary depending on the implementation. For example, other peripheral devices,

20   such as optical disk drives and the like, may be used in addition to or in place of the

hardware depicted in Figure 5. The depicted example is not meant to imply

architectural limitations with respect to the present invention. For example, the

processes of the present invention may be applied to multiprocessor data processing

systems.

Although the present invention has been described primarily with reference to

e-mail communications ones skilled in the art will recognize that the present

invention may be applied to create other types of electronic communications. For

5    example, the present invention may be applied to instant messaging over the Internet,

and to calls over telephone networks, and by pager or radio.

Also, according to the embodiment shown in the Figures, the pass is generated

automatically, and without intentional delay, in response to receipt of every message

received by the sentry which does not have a pass. It should be understood that an

10    alternative embodiment within the scope of the invention includes generating the pass

after notifying the sender that the sender's message needs a pass, and may include

generating the pass only after the sender takes some action to obtain the pass, such as

accessing a web page, sending another e-mail message or instant message, etc.

It is important also to note that while the present invention has been described

15    in the context of a fully functioning data processing system, those of ordinary skill in

the art will appreciate that the processes of the present invention are capable of being

distributed in the form of a computer readable medium of instructions and a variety of

forms and that the present invention applies equally regardless of the particular type

of signal bearing media actually used to carry out the distribution. Examples of

20    computer readable media include recordable-type media such a floppy disc, a hard

disk drive, a RAM, and CD-ROMs and transmission-type media such as digital and

analog communications links.

The description of the present embodiment has been presented for purposes of

illustration and description, but is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to

5    enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.